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ABSTRACT

As part of a job literacy analysis project, 63 entry-level and mid-to-executive level secretaries were interviewed from business, government, and health care settings to describe the literacy requirement skills, tasks, and materials of their jobs. In the 1-hour interview, the job incumbent and interviewer reviewed examples of different types of literacy materials used by the secretary. In the content analysis, the 562 secretary materials collected were grouped into 7 categories based on format and the function for which they were used. The 64 tasks were sorted into 11 job dimensions. Three advisory committees reviewed and critiqued the draft job literacy descriptions for the two secretary jobs. Two survey forms were developed for each of the 2 secretarial jobs and randomly distributed to 14 secretary supervisors or administrators in a pilot test. The return rate for the subsequent nationwide survey of 2,000 secretary recruiters was 399. Respondents in the pilot test and survey were asked whether secretaries in their companies used the materials and rated the importance of various tasks that the secretaries performed using these materials. Results showed that the Job Literacy Analysis methodology used to analyze the literacy requirements of these jobs was effective. (The six-page report is followed by seven tables: subgroup analyses; usage of materials by entry and by mid-to-executive level; most important tasks linked to materials--entry and mid-to-executive levels; and skills summary lists for both levels.) (YLB)

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Job Literacy Analysis: The Secretary Project

Summary Report

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October 1992

Educational Testing Service

Princeton, New Jersey

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JSN
STW
MR
DW

I. Purpose

The purpose of the Secretary project was: 1) to describe the literary requirement skills, tasks and materials of the entry-level secretary job, and the mid-to-executive level secretary job, and 2) to test methodology, called Job Literacy Analysis (JLA), to determine the literacy requirements of the job. The JLA approach applies the framework used in the National Assessment of Educational Progress (NAEP) to the workplace. The NAEP model consists of 3 scales that were designed to represent distinct and important aspects of literacy: prose literacy, which includes prose materials such as newspaper articles, magazines and books; document literacy, which covers the identification and use of materials found in tables, charts, forms, or indexes; and quantitative literacy, in which arithmetic operations are applied to information in printed form, for example, order forms, menus, or advertisements. Job Literacy analysis focuses on skills needed in the job context rather than on the broader range of skills assessed in NAEP.

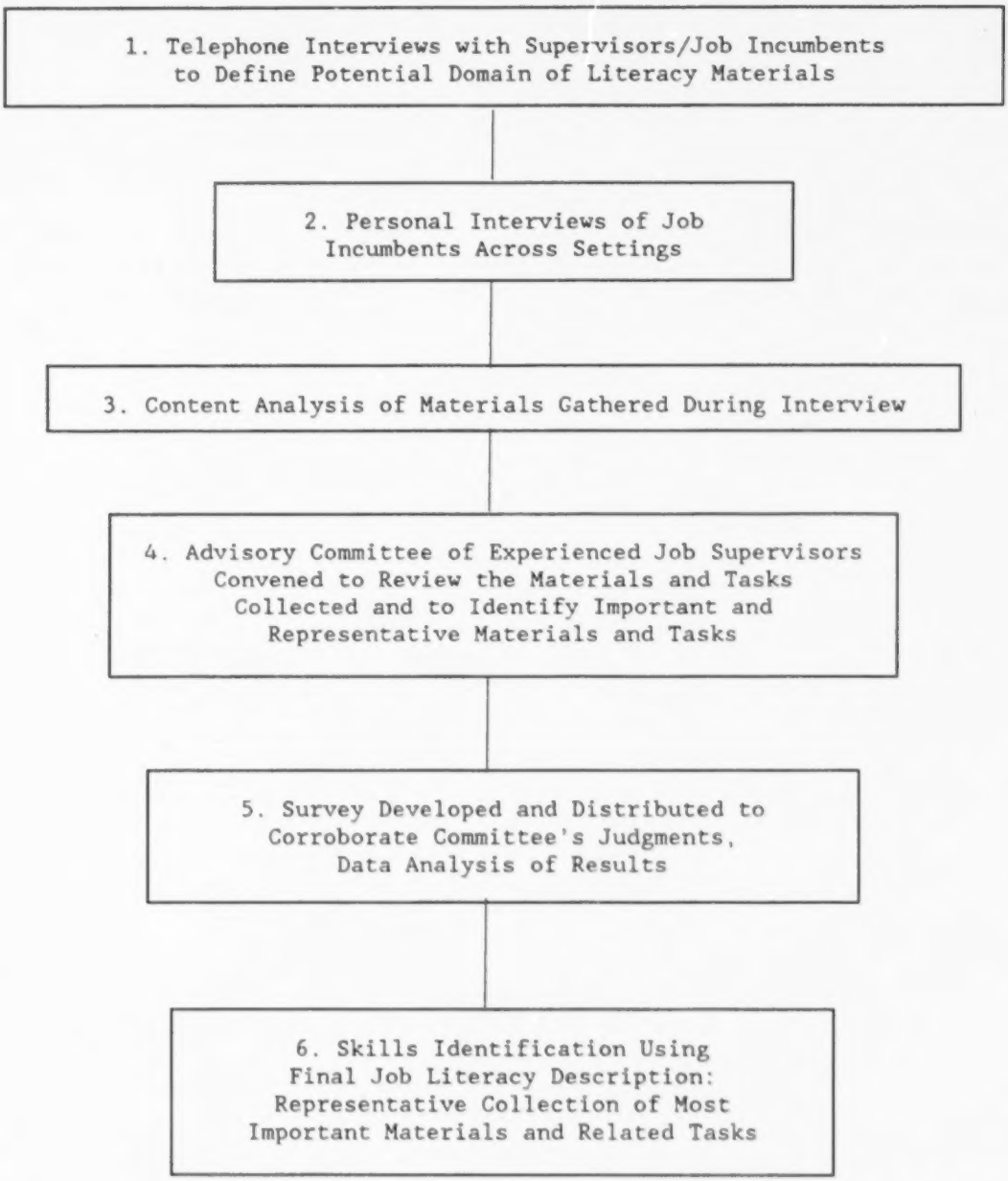
II. Background

The new Job Literacy Analysis methodology tested during this project comprises six basic steps and results in a job literacy description, which includes a representative collection of the most important materials required for competent performance of the job, and the tasks associated with those materials. In the procedure, actual literacy materials used by job incumbents and information about how they are used are gathered during personal interviews. The materials are then analyzed and reduced to a representative set of materials. The resulting draft job literacy description is reviewed by an Advisory Committee of job experts, including supervisors, and sometimes recruiters and trainers. The job literacy description is revised according to the Committee's recommendations and then a survey is developed and distributed nationally to verify the judgements of the group of experts. The survey contains literacy materials, related tasks, and rating scales regarding the use and importance of the materials and tasks. Data analyses are then performed on the survey responses to reveal usage of materials by job incumbents and the importance of the related tasks. The most important literacy materials and related tasks are used to provide the final job literacy description. The last step involves identifying literacy skills required to perform the tasks associated with the materials in the job literacy description. An overview of the steps in Job Literacy Analysis follows on the next page.

III. Results of the Secretary Project

Interviews

A total of 63 entry-level and mid-to-executive level secretaries were interviewed from business, government, and health care settings. During the interviews, 562 literacy materials were collected. Secretaries were asked to provide examples of different types of literacy materials that were used by them, including materials representing the three NAEP literacy scales: manuals, memos and letters (prose literacy), forms, charts, or tables of any sort (document literacy), and materials that are used for calculations of any kind, such as summary charts or travel vouchers (quantitative literacy). The job incumbent was asked to set aside, before the personal interview occurred, copies of ten important materials, representing all three types of literacy, that he or she read and/or used to get his or her job done.


1. Telephone Interviews with Supervisors/Job Incumbents to Define Potential Domain of Literacy Materials
2. Personal Interviews of Job Incumbents Across Settings
3. Content Analysis of Materials Gathered During Interview
4. Advisory Committee of Experienced Job Supervisors Convened to Review the Materials and Tasks Collected and to Identify Important and Representative Materials and Tasks
5. Survey Developed and Distributed to Corroborate Committee's Judgments, Data Analysis of Results
6. Skills Identification Using Final Job Literacy Description: Representative Collection of Most Important Materials and Related Tasks

Job Literacy Analysis Methodology

In the one-hour personal interview, the job incumbent and interviewer reviewed each material. The interviewer asked the worker what the material was used for and how it was used and how important it was to his or her job.

Content Analysis

In the content analysis, the 562 secretary materials were grouped into seven categories based on the materials' format and the function for which they were used. The 64 tasks were sorted into 11 job dimensions. The interviews were separated into entry-level and mid-to-executive level secretary based on the following criteria: current job title, job title of next-higher position, job title of next-lower position, job tasks performed, amount of experience, and specific tasks related to individual interview materials. After this process was completed, 22 of the 63 secretaries interviewed were classified as entry-level secretaries. The 42 remaining secretaries were considered to be mid-to-executive level secretaries.

The materials were chosen based on the mean importance rating provided by the interviewees and the number of interviewees providing the material. Because some materials were provided by more than one interviewee, the tasks for which the materials were used, which often differed by interviewee, were summarized across interviewees. The result of this step, i.e., the draft job literacy descriptions, included the most important materials and related tasks for the two secretary jobs.

Establishment of Advisory Committees

Three separate Advisory Committees were established to review and critique the draft job literacy descriptions for the two secretary jobs. A four-member Local Advisory Committee met in January 1990 to discuss the draft job literacy description for the job of entry-level secretary, and a six-member Local Advisory Committee gathered to review the draft job literacy description for mid-to-executive level secretary in November 1990. A National Advisory Committee, consisting of 14 members, was convened in February 1991 to further refine the literacy descriptions for both secretary jobs, assist in the development of a national survey instrument, and give advice on various survey issues. In order to obtain viewpoints on these matters from various areas of the country, members of this committee represented large companies headquartered in the Princeton area with branch offices nationwide.

The committees included representation by gender, ethnic/racial background, and work setting. Members were supervisors and administrators in business, government and educational settings.

Development of the Survey

Due to length considerations, two survey forms were developed for each of the two secretarial jobs. The two forms for each position were equivalent with regard to material type and length, and all four forms asked the same questions of respondents. In each form of the survey, respondents were asked whether secretaries in their companies used the materials and were then asked to rate the importance of various tasks that the secretaries performed using these materials. The following five-point importance scale was used:

1. Of little importance
2. Moderately important
3. Important
4. Very important
5. Extremely important

Pilot Test of the Survey

The four forms of the survey were randomly distributed to 14 secretary supervisors or administrators who were recommended by Advisory Committee members as individuals who were familiar with the materials used by secretaries in their companies. Each person was asked to complete the survey form and review the instrument for clarity of instructions and format. Follow-up telephone interviews were conducted to obtain comments from the reviewers and determine the time required to fill out the instrument.

The results of the pilot study showed that participants found the survey instructions and format clear, that all four forms of the survey took approximately the same time to complete, and that the time required to fill out each survey fell within the range recommended by the Advisory Committee.

Selection of the Survey Sample

A nationwide survey sample of 2,000 secretary recruiters was obtained with the assistance of the Society of Human Resource Management (SHRM). Names of member companies were randomly selected from the SHRM mailing list.

Administration of the Survey

Five hundred copies of each survey form and a postage-paid return envelope were sent to the presidents of the companies selected from the SHRM mailing list. Each company president received a cover letter asking that he or she give the survey to the company's secretary recruiter to complete. Follow-up postcards were sent to each company approximately one week after the initial mailing to remind each survey participant to complete and return the survey.

RESULTS

Return Rate

Overall, 399 of the 2,000 secretary recruiters (20 percent of the total sample) returned a completed survey. For Form 1 of the Entry-Level Survey, the return rate was 18 percent; for Form 2 of the Entry-Level Survey, the return rate was 24 percent; for Form 1 of the Mid-to-Executive Level Survey, the return rate was 18 percent; and for Form 2 of the Mid-to-Executive Level Survey, the return rate was 19 percent. These represent acceptable return rates for a large-scale mail survey of this type.

Demographic Characteristics of Respondents

Analyses regarding the demographic characteristics of respondents showed that 80 percent of the survey respondents were females and 18 percent were males. The majority (89 percent) of the respondents reported themselves as White (non-Hispanic). The number of individuals employed in the survey respondent's company ranged from less than 100 to 5,000 or more, with approximately half of the companies employing 1,000 or more people. Different types of businesses were also represented by survey respondents, including: 26 percent in finance, insurance and real estate; 19 percent in manufacturing, transportation, and communication; 17 percent in service businesses; 6 percent in public administration; 5 percent in wholesale and retail trade; and 27 percent in other types of businesses (see Table 1).

Materials, Tasks and Skills in Job Literacy Descriptions

Based on information regarding usage of materials by company secretaries, one material category was dropped from the job literacy description of entry-level secretary. The category (Pamphlets, Brochures and Presentation Materials) was used by less than 50 percent of company secretaries, while usage in all the other material categories for the job ranged from 50 percent to 99 percent (see Table 2). In the mid-to-executive level secretary job, all of the material categories were rated as being used by about 50 percent or more of the company's secretaries (see Table 3). Therefore, none of the material categories were dropped from the job literacy description for mid-to-executive level secretary.

The materials in each job literacy description and the two most important related tasks are given in Tables 4 and 5. The literacy skills required to perform the tasks using the materials are shown in Table 6 for entry-level secretaries and in Table 7 for mid-to-executive secretaries. A total of 71 skills were identified in the entry-level secretary position and a total of 74 skills in the mid-to-executive level secretary position.

IV. Discussion

The Job Literacy Analysis methodology was used to analyze the literacy requirements of the jobs of entry-level secretary and mid-to-executive level secretary. The new methodology was effective, as shown by the fact that the majority of survey respondents indicated that materials were used on the job and the tasks for which they were used were judged to be important.

The list of the most important literacy skills for each job can be used to develop training for each of the jobs. It would be helpful to include the actual examples of tasks and materials from each job in the training in order to enhance the appreciation of the skills learned to the workplace setting.

Table 1

Subgroup Analyses
Job Literacy Secretary Project

	Secretary Survey				
Subgroup	Entry Form 1 N = 92	Entry Form 2 N = 120	Mid-Exec Form 1 N = 92	Mid-Exec Form 2 N = 95	Total N = 399
Sex					
Male	17	29	16	11	73
Female	74	89	75	81	319
Race					
White (non-Hispanic)	81	103	85	86	355
Non-White	11	17	7	9	44
Number of Employees					
< 100	18	18	16	12	64
100 - 499	18	30	17	19	84
500 - 599	12	11	5	11	39
1000 - 2499	23	24	14	16	77
2500 - 4999	14	12	19	20	65
5000 +	8	20	15	14	57
Type of Business					
Manufacturing/Transportation/ Communication	17	23	13	21	74
Wholesale/Retail/Trade	3	9	2	5	19
Finance/Insurance/Real Estate	29	27	22	26	104
Service Business	18	18	15	15	66
Public Administration	7	5	6	4	22
Other	18	37	31	21	107

Table 2

Entry Level Secretary

Form 1	
Materials	Percent Used (in descending Order)
Form Letters/Memos	96.7
Computer and other Instructions, Manuals and Help Screens	91.0
Letters/Memos Typed from Manuscripts and Drafts	83.3
Logs	78.3
Schedules and Agenda	77.0
Directories and Organization Charts	73.0
Company Guidelines, Policies and Procedures	68.5
Checklists, Worksheets and Time Records	68.1
Form 2	
Materials	Percent Used (in descending order)
Telephone Messages	100.0
Diaries, Appointment Books, Calendars and Tickler Files	95.8
Travel Forms, Itineraries, Expense Reports, Petty Cash Vouchers and Receipts	81.2
Requisitions and Invoices	74.1
Reports and Newsletters	62.2
Tables and Text Charts	53.9
Reservations, Meeting and Registration Forms	50.8
Pamphlets, Brochures and Presentation Materials	47.9

Table 3

Mid-to-Executive Level Secretary

Form 1	
Materials	Percent Used (in descending Order)
Form Letters/Memos	96.7
Computer and other Instructions, Manuals and Help Screens	93.3
Logs	87.8
Letters/Memos Typed from Manuscripts and Dictation	84.6
Travel Forms, Itineraries, Expense Reports, Petty Cash Vouchers and Receipts	81.1
Announcements and Notices	75.8
Company Guidelines, Policies and Procedures	70.1
Form 2	
Materials	Percent Used (in descending order)
Diaries, Appointment Books, Calendars and Tickler Files	96.8
Meeting Minutes and Agenda	86.0
Graphs and Tables (including spreadsheets)	74.2
Requisitions and Invoices	72.6
Reports, Proposals, Newsletters and Magazines	65.6
Marketing, Public Relations and Presentation Materials	62.4
Time Sheets and Records	58.1

Table 4

ENTRY LEVEL SECRETARY: Most important tasks linked to materials

FORM 1

1. Form Letters/Memos
   - Proofread
   - Print out hard copy of letter, memo or document
2. Letters/Memos Typed from Manuscripts and Drafts
   - Proofread
   - Obtain appropriate signature
3. Computer and other Instructions, Manuals and Help Screens
   - Print out hard copy of letter, memo, or document
   - Format letters, tables, articles and other materials
4. Directories and Organization Charts
   - Answer phones: direct, screen calls, write down messages
   - Maintain existing files
5. Company Guidelines, Policies and Procedures
   - Proofread
   - Type letters/documents from manuscripts
6. Schedules and Agenda
   - Proofread
   - Type letters/documents from manuscripts
7. Logs
   - Send mail/distribute to appropriate department/parties
   - Process forms/reports
8. Checklists, Worksheets and Time Records
   - Proofread
   - Obtain appropriate signature

ENTRY LEVEL SECRETARY: Most important tasks linked to materials (Con't)

FORM 2

1. Telephone Messages
   - Answer phones: direct, screen calls, write down messages
   - Send mail/distribute to appropriate department/parties
2. Diaries, Appointment Books, Calendars and Tickler Files
   - Type letters/documents from manuscripts and dictation
   - Print out hard copy of letter, memo, or document
3. Travel Forms, Itineraries, Expense Reports, Petty Cash Vouchers and Receipts
   - Maintain existing files
   - Follow company policies/procedures in filling out forms
4. Requisitions and Invoices
   - Proofread
   - Answer phones: direct, screen calls, write down messages
5. Reservation, Meeting, and Registration Forms
   - Answer phones: direct, screen calls, write down messages
   - Call up a program and issue commands to retrieve/update data or generate a report
6. Tables and Text Charts
   - Proofread
   - Format and type letters, tables, articles, and other materials
7. Reports and Newsletters
   - Format and type letters, tables, articles, and other materials
   - Make initial check for correctness and completeness

Table 5

MID TO EXECUTIVE LEVEL SECRETARY: Most important tasks linked to materials

FORM 1

1. Form Letters/Memos
   - Proofread text
   - Check for correctness and completeness
2. Letters/Memos Typed from Manuscripts, Drafts and Dictation
   - Proofread text
   - Check for correctness and completeness
3. Computer and other Instructions, Manuals and Help Screens
   - Proofread text
   - Create/use systems for easy retrieval of information on the computer or word processor
4. Company Guidelines, Policies and Procedures
   - Proofread text
   - Maintain and locate information in existing files
5. Announcements and Notices
   - Proofread text
   - Check for correctness and completeness
6. Logs
   - Answer phones: direct, screen calls, write down messages
   - Proofread text
7. Travel Forms, Itineraries, Expense Reports, Petty Cash Vouchers and Receipts
   - Include attachments as required
   - Check for correctness and completeness

MID TO EXECUTIVE LEVEL SECRETARY: Most important tasks
Linked to materials (Con't)

FORM 2

1. Meeting Minutes and Agenda
   - Check for correctness and completeness
   - Proofread text
2. Diaries, Appointment Books, Calendars and Tickler Files
   - Arrange for meetings with multiple participants
   - Schedule appointments/hearings
3. Time Sheets and Records
   - Check for correctness and completeness
   - Obtain appropriate signature/notarization
4. Requisitions and Invoices
   - Check for correctness and completeness
   - Maintain and locate information in existing files
5. Graphs and Tables (including spreadsheets)
   - Check for correctness and completeness
   - Prepare presentation materials, visual aids, report covers
6. Reports, Proposals, Newsletters and Magazines
   - Check for correctness and completeness
   - Proofread text
7. Marketing, Public Relations and Presentation Materials
   - Check for correctness and completeness
   - Proofread text

TABLE 6: SKILLS SUMMARY LIST FOR ENTRY LEVEL SECRETARIES

	ENTRY LEVEL SECRETARY SKILLS SUMMARY LIST
	1. VOCABULARY (V)
1.	Read and understand common words
2.	Read and understand job-specific words
3.	Read and understand abbreviations, contractions, and acronyms
4.	Read and understand symbols and codes
5.	Determine a word's meaning from the context of a sentence
	2. GRAMMAR, EDITING, AND SPELLING (GES)
1.	Apply rules of grammar
2.	Recognize words needing capitalization
3.	Apply rules for punctuation (e.g., commas, periods, apostrophes, semicolons)
4.	Make wording changes to improve clarity
5.	Spell common words correctly
6.	Spell job-specific words correctly
7.	Use references to check and correct spelling errors
	3. TELLING TIME (TT)
1.	Read and understand printed time
2.	Read and understand the relationship of time on a clock to printed time
3.	Read and understand dates and/or printed times on a calendar
	4. FORMS (F)
1.	Locate the space on a form to enter data
2.	Transfer or copy exact data from other sources onto appropriate section of a form (e.g., copy data from intersection of table columns and rows)

ENTRY LEVEL SECRETARY SKILLS SUMMARY LIST (continued)	
	4. FORMS (F) continued
3.	Enter data (created/generated) into the appropriate spaces on a form
4.	Write a description of an activity or transaction in appropriate section of a form
5.	Locate or compare information using a completed form
	5. FOLLOWING DIRECTIONS (FD)
1.	Follow directions to complete a task that includes reading, identifying, observing and/or comparing
2.	Identify and use appropriate sections of text and visual materials to complete a task
3.	Follow very specific step-by-step directions to perform a sequence of tasks
4.	Read and understand the main idea of job-specific material
5.	Determine appropriate course of action in a particular situation
6.	Synthesize information from more than one source (e.g., written, pictorial, oral) to complete a task
	6. READING AND REFERENCE SKILLS (RS)
1.	Use alphabetic and alphanumeric filing system (e.g., locating files, filing information)
2.	Find information by using a table of contents, index, appendix, and glossary
3.	Find appropriate section of reference source (e.g., sentence, paragraph, heading, table) to answer a specific question
4.	Find information by skimming or scanning text
5.	Find information by cross-referencing sources
6.	Synthesize/summarize information from more than one section of a reference source to answer a specific question

ENTRY LEVEL SECRETARY SKILLS SUMMARY LIST (continued)	
	6. READING AND REFERENCE SKILLS (RS) continued
7.	Synthesize/summarize information from more than one reference source to answer a specific question
8.	Determine the main idea of a paragraph
9.	Determine the main idea of reference material (e.g., passages, letters, articles)
	7. NUMBERING AND COUNTING (NC)
1.	Match numbers with words used as codes or labels
2.	Read or write numbers in sequence
3.	Read and understand telephone and telefax numbers
	8. TABLES, CHARTS, AND GRAPHS (TCG)
1.	Locate and extract information from a two-column table or chart
2.	Locate and extract information from an intersection of a row-by-column table or chart
3.	Utilize information from the intersection of a complex table or chart to compare data within the table or chart
4.	Utilize information from the intersection of a complex table or chart to compare data with text, document materials or objects outside the table or chart
5.	Utilize information from tables, charts, or graphs to choose a course of action or solve a math problem
6.	Locate and extract information from a graph
7.	Locate and extract information from a pie chart
8.	Locate and extract information from a bar graph
	9. ADD AND SUBTRACT (AS)
1.	Add and subtract integers
2.	Add and subtract decimals

ENTRY LEVEL SECRETARY SKILLS SUMMARY LIST (continued)	
	9. ADD AND SUBTRACT (AS) continued
3.	Add and subtract fractions
4.	Add and subtract mixed numbers (integers and fractions)
5.	Add and subtract printed time (hours and minutes)
6.	Add and subtract linear, weight and volume measures (e.g., liquid, dry, degree)
7.	Determine an estimate of a sum or difference (integers, fractions or decimals)
8.	Use addition and subtraction to solve problems involving integers, mixed numbers, fractions, and/or decimals
	10. MULTIPLY AND DIVIDE (MD)
1.	Multiply and divide integers
2.	Multiply and divide decimals
3.	Multiply and divide fractions
4.	Multiply and divide mixed numbers (integers and fractions)
5.	Multiply and divide linear, weight and volume measures (e.g., liquid, dry, degree)
6.	Determine an estimate of a product or quotient (integers, fractions or decimals)
7.	Use multiplication and division to solve problems involving integers, mixed numbers, fractions, and/or decimals
	11. OTHER ARITHMETIC PROCESSES (OAP)
1.	Reduce fractions to lower terms
2.	Determine averages
3.	Solve problems that combine more than one process (e.g., addition and multiplication, multiplication and division)

ENTRY LEVEL SECRETARY SKILLS SUMMARY LIST (continued)	
	11. OTHER ARITHMETIC PROCESSES (OAP)-continued
4.	Solve problems involving units of measurement that combine more than one process (e.g., addition and multiplication, multiplication and division)
5.	Solve problems that require conversion
6.	Solve ratio and proportion problems
7.	Read and understand information from scales to solve math problems
	12. RECOGNITION
1.	Identify and label objects
2.	Identify objects by particular physical characteristics (e.g., size, shape, color)
3.	Select appropriate course of action by using taste, touch, sight, or hearing

TABLE 7

MID-TO-EXECUTIVE LEVEL SECRETARY SKILLS SUMMARY REPORT

1. VOCABULARY (V)

1. Read and understand common words
2. Read and understand job-specific words
3. Read and understand abbreviations, contractions, and acronyms
4. Read and understand symbols and codes
5. Determine a word's meaning from the context of a sentence

2. GRAMMAR, EDITING, AND SPELLING (GES)

1. Apply rules of grammar
2. Recognize words needing capitalization
3. Apply rules for punctuation (e.g., commas, periods, apostrophes, semicolons)
4. Make wording changes to improve clarity
5. Spell common words correctly
6. Spell job-specific words correctly
7. Use reference to check and correct spelling errors

3. TELLING TIME (TT)

1. Tell time using a clock
2. Read and understand printed time
3. Read and understand the relationship of time on a clock to printed time
4. Read and understand dates

4. FORMS (F)

1. Locate the space on a form to enter data
2. Transfer or copy exact data from other sources onto appropriate section of a form (e.g., copy data from intersection of table columns and rows)
3. Enter data (created or generated) into the appropriate spaces on a form
4. Write a description of an activity or transaction in appropriate section of a form
5. Locate or compare information using a completed form

5. FOLLOWING DIRECTIONS (FD)

1. Follow directions to complete a task that includes reading, identifying, observing and/or comparing
2. Identify and use appropriate sections of text and visual materials to complete a task
3. Follow very specific step-by-step directions to perform a sequence of tasks
4. Read and understand the main idea of job-specific material
5. Determine appropriate course of action in a particular situation
6. Synthesize information from more than one source (e.g., written, pictorial, oral) to complete a task

6. READING AND REFERENCE SKILLS (RS)

1. Use alphabetic and alphanumeric filing system (e.g., locating files, filing information)
2. Find information by using a table of contents, index, appendix, and glossary
3. Find appropriate section of reference source (e.g., sentence, paragraph, heading, table) to answer a specific question
4. Find information by skimming or scanning text
5. Find information by cross-referencing sources
6. Synthesize/summarize information from more than one section of a reference source to answer a specific question
7. Synthesize/summarize information from more than one reference source to answer a specific question
8. Determine the main idea of a paragraph
9. Determine the main idea of reference material (e.g., passages, letters, articles)

7. NUMBERING AND COUNTING (NC)

1. Match numbers with words used as codes or labels
2. Read or write numbers in sequence
3. Read or write a number (digits, integers, and decimals)
4. Round integers or decimals
5. Read or recognize the meaning of percentages
6. Read and understand telephone and telefax numbers
7. Count by intervals of one, two, five or ten

8. TABLES, CHARTS, AND GRAPHS (TCG)

1. Locate and extract information from a two-column table or chart
2. Locate and extract information from an intersection of a row-by-column table or chart
3. Utilize information from the intersection of a complex table or chart to compare data within the table or chart
4. Utilize information from the intersection of a complex table or chart to compare data with text, document materials or objects outside the table or chart
5. Utilize information from tables, charts, or graphs to choose a course of action or solve a math problem
6. Locate and extract information from a graph
7. Locate and extract information from a pie chart
8. Locate and extract information from a bar graph

9. ADD AND SUBTRACT (AS)

1. Add and subtract integers
2. Add and subtract decimals
3. Add and subtract fractions
4. Add and subtract mixed numbers (integers and fractions)
5. Add and subtract printed time (hours and minutes)
6. Add and subtract linear, weight and volume measures (e.g., liquid, dry, degree)
7. Determine an estimate of a sum or difference (integers, fractions or decimals)
8. Use addition and subtraction to solve problems involving two or more of the following: integers, mixed numbers, fractions, and/or decimals

10. MULTIPLY AND DIVIDE (MD)

1. Multiply and divide integers
2. Multiply and divide decimals
3. Multiply and divide fractions
4. Multiply and divide mixed numbers (integers and fractions)
5. Multiply and divide linear, weight and volume measures (e.g., liquid, dry, degree)
6. Determine an estimate of a product or quotient (integers, fractions or decimals)
7. Use multiplication and division to solve problems involving two or more of the following: integers, mixed numbers, fractions, and/or decimals

11. OTHER ARITHMETIC PROCESSES (OAP)

1. Reduce fractions to lower terms
2. Determine averages
3. Solve problems that combine more than one process (e.g., addition and multiplication and division)
4. Solve problems involving units of measurement that combine more than one process (e.g., addition and multiplication, multiplication and division)
5. Solve problems that require conversion
6. Solve ratio and proportion problems
7. Read and understand information from scales to solve math problems

12. RECOGNITION

1. Identify objects by particular physical characteristics (e.g., size, shape, color)